

RINGKASAN

Produktivitas kedelai di Indonesia masih tergolong rendah yaitu rata-rata sekitar 1,3 ton/ha dengan kisaran 0,6-2,0 ton/ha. Peningkatan produktivitas dapat dilakukan dengan meningkatkan pertumbuhan tanaman dan komponen hasil. Penggunaan karakter juvenil panjang (*long juvenile*) dapat dimanfaatkan dalam perakitan varietas baru di negara tropis karena karakter ini memperlambat umur berbunga pada kondisi panjang hari pendek (sekitar 12 jam), sehingga pertumbuhan vegetatif tanaman kedelai lebih optimum dan mendukung peningkatan hasil kedelai. Ketahanan terhadap pecah polong juga merupakan salah satu karakter penting karena dapat mengurangi resiko kehilangan hasil. Berdasarkan hal tersebut, penelitian keragaan karakter agronomi, hasil dan komponen hasil kedelai produktivitas tinggi perlu dilakukan. Penelitian ini bertujuan untuk 1) mengetahui keragaan karakter agronomi, hasil dan komponen hasil galur-galur kedelai produktivitas tinggi dengan karakter juvenil panjang di Cianjur, Jawa Barat, dan 2) memperoleh galur-galur yang tahan pecah polong.

Penelitian dilaksanakan di Kebun Petani di Desa Gasol, Kecamatan Cugenang, Kabupaten Cianjur, Jawa Barat dan di Laboratorium Biologi Molekuler Balai Besar Penelitian Bioteknologi dan Sumber Daya Genetik Pertanian (BB Biogen), Bogor pada bulan September 2020 hingga Februari 2021. Penelitian di lapangan menggunakan Rancangan Acak Kelompok (RAK) dengan dengan satu faktor yaitu 57 galur/varietas sebagai perlakuan, terdiri dari 54 galur uji, 1 genotipe tetua (Melrose) dan 2 varietas unggul nasional (Anjasmoro dan Biosoy-1). Masing-masing perlakuan diulang sebanyak tiga kali dan diambil lima sampel tanaman per ulangan. Variabel yang diamati keragaan karakter agronomi, hasil dan komponen hasil yang terdiri dari tinggi tanaman, diameter batang, warna hipokotil, warna bunga, umur berbunga, umur masak, warna bulu polong, warna hilum, jumlah cabang pertanaman, jumlah buku subur per tanaman, jumlah polong isi per tanaman, bobot 100 biji, hasil biji (ton/ha) dan ketahanan terhadap pecah polong. Data kuantitatif dianalisis menggunakan analisis sidik ragam (ANOVA) pada taraf 5% dan 1%. Perlakuan yang menunjukkan perbedaan nyata ($F_{hitung} > F_{tabel}$ 5% dan 1%), maka akan diuji lanjut dengan uji Scott-Knott pada taraf 5%.

Berdasarkan hasil analisis data diketahui terdapat 48 galur uji yang memiliki hasil tanaman (ton/ha) lebih tinggi dari varietas pembanding karena galur uji memiliki karakter juvenil panjang yang disertai keragaan agronomi dan komponen hasil yang lebih baik daripada varietas pembanding tanpa karakter juvenil panjang. Berdasarkan hasil analisis molekuler terdapat 13 galur yang membawa gen tahan pecah polong *pdh1*. Berdasarkan pengujian ketahanan pecah polong menggunakan metode oven, diperoleh 3 varietas tahan (Anjasmoro, Detap-1 & Melrose), 1 varietas moderat (Biosoy-1), 1 varietas peka (Grobogan), 22 galur tahan, 31 galur moderat dan 1 galur peka.

SUMMARY

Soybean productivity in Indonesia is still low, with an average 1.3 tons/ha ranged from 0.6-2.0 tons/ha. The increasing of productivity soybean can be obtained by increasing plant growth and yield components. Long juvenile character can be utilized in the development of new varieties in tropical countries because the long juvenile soybeans flower late in short-day long conditions (around 12 hours), hence the vegetative growth of soybean plants is more sufficient and facilitate soybean yield. The resistance of pod shattering is an important characteristic because it reduces the risk of yield loss. Based on these, research of the performance of agronomic characters, yield and yield components of high productivity soybean lines need to be carried out as a basis for selection in the preliminary yield test of the soybean lines. This study was aimed to 1) determine the agronomic character performance, yield and yield components of high yield long juvenile soybean lines in Cianjur, West Java and 2) obtain soybean lines that are resistant to pod shattering.

The research was conducted in the Farmer farm in Gasol Village, Cugenang District, Cianjur and Molecular Biology Laboratory of the Indonesian Center for Agricultural Biotechnology and Genetic Resources Research and Development (ICABIOGRAD), Bogor from September 2020 to February 2021. This research was carried out using Randomized Block Design (RBD) using a single treatment factor of 57 soybean genotypes consisting of 54 soybean lines, 2 comparative varieties (Anjasmoro and Biosoy-1) and a parent genotype (Melrose). Each treatment was replicated three times and there were five sample plants to be observed from each plot. The observed variables are performance of agronomic characters, yield and yield components of high productivity soybean included plant height, stem diameter, hypocotyl color, branch number per plant, number of productive node per plant, flowering time, flower color, filled pod number per plant, maturity time, pubescent color, hilum color, 100-seed weight, seed yield (ton/ha), and pod shattering resistance. Quantitative data were analyzed using analysis of variance (ANOVA). Variables that significantly different (F count $>$ F table 5% and 1%) would be followed by Scott-Knott at 5% level.

Based on data analysis, the seed yield (ton/ha) of 48 soybean lines is higher than comparative checks as these lines have long juvenile character with improved agronomic characters and yield components. Based on molecular analysis, there are 13 lines and 3 check varieties (Anjasmoro, Detap-1 and Melrose) that carry pod shattering resistance gene. Based on oven method test, there are 3 resistant check varieties (Anjasmoro, Detap-1 and Melrose), 1 moderate variety (Biosoy-1), 1 susceptible variety (Grobogan), 22 resistant lines, 31 moderately resistant and 1 susceptible line.